

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Martin R. Handforth

Application No.: 09/821722

Filed: 3/29/2001

Title: Signal Layer Interconnects

Attorney Docket No.: 13888R0US02U 120-042

Group Art Unit:
2827

Conf. No. 4607

Examiner:
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Commissioner for Patents
P.O. Box 1450
Arlington, VA 22313-1450RESPONSE UNDER 37 CFR 1.111

Dear Sir:

Please enter the following Amendment and Remarks in response to the Office Action of December 4, 2003. Kindly amend the claims as shown on the attached sheets.

Claims 1-3, 5, 6, 12 and 13 are currently under examination, and have been rejected, of which claims 1 and 12 are independent claims. Claims 1 and 12 are currently amended.

35 USC §103 Rejections

Claims 1-3, 5, 6, 12 and 13 were rejected over Inasaka in view of Ball. The claims as amended distinguish the cited combination by reciting that the exposed inner layer trace is a signal trace with protrusions for connection with a corresponding exposed signal trace. Inasaka teaches a laminate wiring board with an exposed power layer having pads for connection. For example, in Fig. 2 Inasaka shows pads (16) connected with electrode (36). Further, Inasaka shows liberal use of through holes (22). While the Inasaka teaching may be acceptable for power distribution, it is not as suitable for transmission of high frequency signals. As discussed in the

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Background section of the application, vias contribute to problems such as impedance mismatch and cross-talk with adjacent signal layers. As further discussed starting at page 2, line 7, high frequency performance is partly determined by geometry. Small area contact point connectors such as the electrodes 36 of Inasaka are liable to introduce impedance mismatches because the surface and cross-sectional areas of the point contact in combination with the change in direction of the conductor differ from a continuous conductive trace. The present invention mitigates the shortcomings of known interconnection techniques by approximating of a continuous trace by directly connecting one signal trace with another signal trace. The Examiner cites Ball as showing use of conductive traces for power. However, the cited combination fails to suggest directly connecting an inner layer signal trace with another signal trace. Hence, claims 1 and 12 distinguish the cited combination by reciting **a conductive signal trace disposed on substrate material proximate to an edge of the interconnection device and being accessible for direct electrical connection with a corresponding exposed signal trace**. In view of the above claims 1 and 12 are allowable over the cited combination of references and withdrawal of the rejections is respectfully requested.

Support for the claim amendments is found at various places in the application as filed. For example, at page 3 starting at line 19 the direct connection of exposed traces is described. Similarly, Fig. 2 illustrates direct connection of inner layer traces of one device with the inner layer traces of another device. Indeed, the Title of this application is "Signal Layer Interconnects."

Claims 2, 3, 5, 6, and 13 further distinguish the independent claims from the cited combination. For example, claim 3 recites that the traces are exposed by removing a portion of the outer layer. Claims 5 and 6 further distinguish the protrusions employed on the exposed

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trace. Further, the sections cited by the Examiner as suggesting the claimed protrusions merely describe the conductive pads, not protrusions on pads. In view of the above claims 2, 3, 5, 6, and 13 are allowable over the cited combination of references and withdrawal of the rejections is respectfully requested.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Holmes W. Anderson, Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application, including all claims currently under examination, is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

27 April 2004
Date


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dd: 03/04/2004